

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Javit A. Drake et al. Art Unit : 1745
Serial No. : 10/664,822 Examiner : Robert W. Hodge
Filed : September 16, 2003 Conf. No. : 3431
Title : ENHANCED FUEL DELIVERY FOR DIRECT METHANOL FUEL CELLS

Mail Stop Appeal Brief - Patents

Commissioner for Patents
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REPLY BRIEF

Pursuant to 37 C.F.R. § 41.41, Appellants respond to the Examiner's Answer as follows:

(1) Claims 11-23 are based on a disclosure that is enabling

Claims 11-23

The examiner continues to allege that claims 11-23 are based on a disclosure that is non-enabling. The examiner's position is solely based on the examiner's misuse the Summary of the Claimed Subject Matter section of Appellant's Appeal Briefs and the examiner's incorrect presumption that Appellant has allegedly admitted criticality of placement of the multilayer membrane in the embodiment illustrated in Appellant's Fig. 2B in the Appeal Briefs.¹

In the appeal brief filed 4/13/09 in the Summary of Claimed Subject Matter applicants show the criticality of the location and orientation of the multilayer membrane specifically with regards to the embodiment illustrated in Figure 2B, which is described as being the representative embodiment recited in the claims. Currently there is no recitation in any of claims 11-23 that clearly depicts the specific location and orientation of the composite membranes as illustrated in the embodiment of Figure 2B.

Appellant disagrees and contends that no specific location or orientation of the membrane has been shown or described to be critical by Appellant. The examiner's contention is not based on any limitations in the claims or any teachings missing from or contained in the Specification.

¹ Examiner's Answer dated 8/17/2009, Page 3.

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Rather, the contention is based on the examiner's misuse of the Summary of Claimed Subject Matter section of Appellant's first Appeal brief filed 04/13/2009 where the Appellant cited portions from the specification to show support for the claim limitations and the subsequent Appeal Brief filed on June 29, 2009, which contains the same Summary of Claimed Subject Matter section.

The examiner continues to misconstrue the purpose of the Summary of Claimed Subject Matter section of an Appeal Brief, which is to "enable the Board to more quickly determine where the claimed subject matter is described in the application."² The examiner has not offered any reasoning that the claimed subject matter is not described or enabled by the sections referred to in the Briefs.

Regarding essential material, MPEP §2172.01 and the cases cited therein³ clearly require essential material to be identified as such:

"[a] claim which omits matter disclosed to be essential to the invention as described in the specification... may be rejected under 35 U.S.C. §112, first paragraph as not enabling... such essential matter may include missing elements, steps or necessary structural cooperative relationships of elements described by the applicant(s) as necessary to practice the invention."⁴ (emphasis added)

² **>(v) Summary of claimed subject matter. A concise explanation of the subject matter defined in each of the independent claims involved in the appeal, which must refer to the specification by page and line number, and to the drawing, if any, by reference characters.< While reference to page and line number of the specification **>requires< somewhat more detail than simply summarizing the invention, it is considered important to enable the Board to more quickly determine where the claimed subject matter is described in the application.> MPEP 1205.02 (v)

³ At the outset, it is well recognized that the patent's disclosure makes crystal clear that a particular (i.e., narrow) understanding of a claim term is an "essential element of [the inventor's] invention.""). See Gentry Gallery, Inc. v. Berkline Corp., 134 F.3d 1473, 45 USPQ2d 1498 (Fed. Cir. 1998); Tronzo v. Biomet, 156 F.3d at 1158-59, 47 USPQ2d at 1833 (Fed. Cir. 1998) (claims to generic cup shape were not entitled to filing date of parent application which disclosed "conical cup" in view of the disclosure of the parent application stating the advantages and importance of the conical shape.). A claim that omits an element which applicant describes as an essential or critical feature of the invention originally disclosed does not comply with the written description requirement. Gentry Gallery, 134 F.3d at 1480, 45 USPQ2d at 1503; In re Sus, 306 F.2d 494, 504, 134 USPQ 301, 309 (CCPA 1962) ("[O]ne skilled in this art would not be taught by the written description of the invention in the specification that any 'aryl or substituted aryl radical' would be suitable for the purposes of the invention but rather that only certain aryl radicals and certain specifically substituted aryl radicals [i.e., aryl azides] would be suitable for such purposes.") (emphasis in original).

⁴ *Id.* 2100-210

Thus, in order for the examiner to properly construe the location as essential or necessary Appellant's specification must have described the location as being essential or necessary, which of course it does not. Nor for that matter did Appellant's Summary of Claimed Subject Matter described the location as being essential or necessary. Appellant contends that neither the application, as filed, nor any statement made during prosecution described any particular subject matter as "essential or necessary."

The examiner cited *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976) as authority for his reasoning. *Mayhew* involved a case where the Applicant's specification described a cooling bath and its location as essential. No such statement however is found in Appellant's specification that any particular orientation or any particular element is essential.

Merely, because Appellant has illustrated certain embodiments of the invention does not mean that any of the illustrated features are essential to the invention. Nor has Appellant made any statements during prosecution that any particular location or element is essential to the invention. The presence of material in one of Appellant's embodiments to show support for this claim does not constitute such statements. The examiner has yet again failed to furnish any authority to the contrary.

The examiner does not address the above contention of Appellant in the Examiner's Answer but continues to base his contentions on an allegedly inoperative embodiment (that is neither described nor specifically claimed by Appellant):⁵

Therefore given the broadest most reasonable interpretation of the above recitation, the composite membrane only needs to exist somewhere inside of the fuel cartridge housing but it does not matter where the membrane is located nor does it matter what orientation the membrane takes with relationship to any structure of the fuel cartridge housing. So therefore the membrane can be present (i.e. reside) over and covering the entire opening for the fuel egress port, which is the only opening recited in the claim, and by residing over and covering the entire opening the fuel cartridge will not be capable of releasing the methanol fuel because as defined by the claim the membrane has a methanol-impermeable coating.

⁵ Examiner's Answer dated 8/17/2009, Page 6.

Indeed, the examiner is correct in observing that the membrane, as claimed in claim 11, need not be at a specific location or orientation within the housing as long as it is within the housing. Appellant contends that the location of the membrane is not needed to distinguish the claimed subject matter over the cited art. Rather, Appellant's invention regarding claim 11 is the combination of the specific membrane and the housing that distinguishes the claim over the prior art.

The examiner seems to ignore that one skilled in the art would be adequately enabled by the specification to ascertain how to position the composite membrane within the housing. One skilled in the art would not arrange the membrane in a manner as argued by the examiner at least because it would be contrary to common sense to arrange it in a way that according the examiner would not allow methanol to escape. Indeed, the examiner has not shown that even with this contrived embodiment that the arrangement would not allow some methanol to escape.

The examiner further states:⁶

In the instant case at least the first two tests of In re Wands apply, "The breadth of the claims" and "The nature of the invention". As already discussed above the breadth of the claims encompasses at least one embodiment if not more that is inoperable. Regarding the nature of the invention, it is the nature of the invention to dispense methanol out of the fuel cartridge, if as discussed above the methanol impermeable membrane resides over and covers the entire opening of the fuel egress port then the cartridge is incapable of dispensing methanol which therefore goes against the nature of the invention.

Appellant disagrees. The examiner has put forward only a single embodiment that is allegedly inoperative while merely presenting a hand-waving statement with respect to the alleged presence of other inoperative embodiments. In this respect, MPEP 2164.08(b) clearly states that the presence of inoperative embodiments within the scope of a claim does not necessarily render a claim non enabled.⁷ Rather, the test is whether a skilled person with no

⁶ Examiner's Answer, Page 9

⁷ MPEP 2164.08(b): The presence of inoperative embodiments within the scope of a claim does not necessarily render a claim nonenabled. The standard is whether a skilled person could determine which embodiments that were conceived, but not yet made, would be inoperative or operative with expenditure of no more effort than is normally

more than normal effort (lack of undue experimentation) can determine embodiments that are in fact operable. Appellant contends that one of minimal skill in the art would nonetheless be enabled by the Appellant's specification in unambiguously determining operable embodiments and need not use the allegedly inoperative embodiment put forward by the examiner.

The examiner is clearly considering "the breadth of claims" and "the nature of invention" as stand-alone factors while ignoring the other *Wand*⁸ factors that should be considered in determining non-enablement of a disclosure. The examiner's reasoning is in direct contradiction to the MPEP which clearly warns against such analysis.⁹ Appellant contends that the examiner is ignoring at least the following factors in determining non-enablement of the Appellant's disclosure: "the level of predictability in the art," "the amount of direction provided by the inventor," and "the quantity of experimentation needed to make or use the invention based on the content of the disclosure."

Appellant contends that the examiner's reasoning is flawed and not based on the facts as taught by the Applicant's Specification, at least because of the reasons mentioned above. The Examiner is clearly not construing the claims in light of the Specification and relies on this rejection precisely because the examiner is unable to find any teaching in the prior art that renders claim 11 anticipated or obvious.

required in the art. *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.*, 750 F.2d 1569, 1577, 224 USPQ 409, 414 (Fed. Cir. 1984) (prophetic examples do not make the disclosure nonenabling).

⁸ *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

⁹ MPEP 2164.01(a) : It is improper to conclude that a disclosure is not enabling based on an analysis of only one of the above factors while ignoring one or more of the others. The examiner's analysis must consider all the evidence related to each of these factors, and any conclusion of nonenablement must be based on the evidence as a whole. 858 F.2d at 737, 740, 8 USPQ2d at 1404, 1407.

(2) Claims 11-23 distinctly claim Appellant's invention

Claims 11-23

The examiner rejects claims 11-23 under 35 U.S.C. second paragraph as failing to set forth subject matter which the Applicant(s) regards as their invention. The Examiner states:¹⁰

Claims 11-23 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. Evidence that claims 11-23 fail(s) to correspond in scope with that which applicant(s) regard as the invention can be found in the reply filed 4/13/09. In that paper, applicant has stated that figure 28 represents the embodiment that is recited in the above listed claims, and this statement indicates that the invention is different from what is defined in the claim(s) because claim 11 only recites that the composite membrane resides in the housing but does not recite any specific location or orientation within the housing.

Claims 11-23 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: specific location and orientation of the composite membrane within the fuel cartridge housing.

Appellant disagrees. Claims 11-23 distinctly point out the subject matter of what Appellant(s) consider to be their invention.¹¹ For analogous reasons mentioned above with respect to the rejections under 35 U.S.C. 112 first paragraph, claim 11 does not omit any essential structural cooperative relationship of elements as alleged by the examiner.

The examiner continues to misconstrue the role of the claims. Appellant reiterates that it is not the role of the claims to enable one skilled in the art to reproduce the invention, but rather to define the legal metes and bounds of the invention. *In re Geofe*, 526 F.2d 1393, 1397, 188 U.S.P.Q. 131, (CCPA, 1975). Further, the examiner states:¹²

As in the instant case, claim 11 is amenable to at least two if not more plausible claim constructions, one of said claim constructions as clarified

¹⁰ Examiner's Answer dated 8/17/2009, Page 3-4.

¹¹ 35 U.S.C. 112, second paragraph. "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

¹² Examiner's Answer dated 8/17/2009, Page 8.

above can read on an inoperable embodiment and therefore claim 11 and any claim that depends on claim 11 is indefinite for not precisely defining the metes and bounds of the claimed invention.

Appellant disagrees. The examiner has not provided any reasonable basis for this contention. The metes and bounds of the claimed invention is appropriately defined by Appellant's claims. Appellant does not consider it necessary to specify any orientation of the membrane at least because the examiner has failed to produce any prior art that would require Appellant to limit the scope of the claims to any particular orientation. One skilled in the art would have no difficulty in ascertaining the scope of claim 11. Indeed, one skilled in the art would conclude that the scope of claim 11 is not limited to a particular orientation of the membrane with respect to the housing, but is limited to the membrane being disposed in the housing.

Appellant reiterates that it is sufficient to distinguish over the art that the combination of the claimed composite membrane and housing has the composite membrane within the housing. One skilled in this art would clearly understand the metes and bounds of the these claims, and would realize that the claims cover various orientations of the composite membrane in the housing.

**(3) Claims 24-30, 32 and 33 are not anticipated
by Kaschemekat**

The examiner continues to reject claims 24-30, 32 and 33 under 35 U.S.C. 102(b) as anticipated by Kaschemekat and contends that Appellants have argued a functional limitation allegedly not recited in the claims:

Regarding claims 24 and 26 as being anticipated and/or unpatentable over Kaschemekat, appellants' arguments are not commensurate with the scope of the claims. Appellants argue functional limitations that are not even recited in the above listed claims.

Appellant has not argued a function limitation, as contended by the examiner. Rather, Appellant has shown that Kaschemekat neither describes nor suggests a composite membrane including "a coating of a methanol-impermeable material disposed over an opposite surface of a

substrate.” Kaschemekat merely describes a permselective membrane that the examiner alleges could be permeable to methanol. Kaschemekat does not describe the permselective layer to be impermeable, but instead requires the layers to be permeable in order to permit through the membrane. Nothing in Kaschemekat describes an impermeable and in particular a methanol impermeable layer, as recited by claim 24.

Claim 25

With respect to Appellant’s claim 25, the examiner states:¹³

Regarding claim 25, claim 25 recites only functional limitations and it is submitted that the materials as discussed in the grounds of rejection as well as above is capable of performing the functional limitations of claim 25, especially given the fact that Appellants have failed to provide any evidence to the contrary that the materials recited in Kaschemekat are not methanol impermeable.

Appellant disagrees and contends that Kaschemekat does not even suggest, much less disclose a “substrate is provided to hold methanol in a liquid state within the porous material to enable liquid methanol to migrate to the polymer membrane and convert to a vapor phase.” In order to *hold* methanol within its porous substrate, the membrane of Kaschemekat would require at least one of its outer layers to be impermeable to methanol. Kaschemekat, on the other hand is directed to achieve flow throughput of permeate *through* the membrane and therefore describes all layers of the membrane to be permeable to the fuel used. The examiner responds to Appellant’s arguments with respect to claim 27 using a similar basis of “functional recitations.”

Appellant contends that the examiner relies on the dubious grounds of “functional limitations” precisely because the examiner is unable to find any teaching in the prior art that satisfies the language of claims 25 and 27. Appellants also note that originally, the examiner viewed Kaschemekat only as a secondary reference that was used to modify the then primary reference Hockaday.¹⁴ Kaschemekat was presented as the primary reference and was alleged to both anticipate and render obvious Appellant’s claims 24-30, 32 and 33 only after filing of the

¹³ Examiner’s Answer, Page 10.

¹⁴ U.S. Patent No. 6,645,651.

first appeal brief. Since the examiner had every opportunity to raise these issues much earlier, Appellant finds the examiner's actions to show that Kaschemekat in fact does not anticipate or render obvious these claims.

(4) Claims 24-30, 32 and 33 are not obvious over Kaschemekat

The examiner continues to maintain the obviousness rejection of claims 24-30, 32 and 33 over Kaschemekat. In response to Appellant's second Appeal Brief, the examiner states:¹⁵

Regarding the obviousness statement, it is still the position of the Examiner that because Kaschemekat clearly teaches that the different materials are chosen based on their selectivity, a skilled artisan would understand to pick the materials that would be appropriate for the application at hand.

Appellant disagrees and reiterates that one of ordinary skill in the art would not modify Kaschemekat with a methanol impermeable layer, as contended by the Examiner, at least because such a choice would violate the basic operating principles of Kaschemekat. The membrane in Kaschemekat is designed to achieve optimum flow throughput¹⁶ and has a feed side and a permeate side.¹⁷ A liquid mixture fuel is in contact with the feed side of the membrane. The liquid fuel *passes through* the membrane and is removed in vapor form from the permeate side “One or more of the feed liquid components pass through the membrane and are withdrawn in vapor form on the permeate side.”¹⁸ Kaschemekat specifically describes the permselective layer to be thin such that very high permeate vapor fluxes may be obtained.¹⁹ Assuming *arguendo* that one of ordinary skill modifies Kaschemekat as alleged by the examiner, Appellant contends that such a modification would not result in Appellant's claimed features, but instead would merely render Kaschemekat's composite membrane inoperable and hence would offer no basis to modify Kaschemekat's composite membrane to include a methanol impermeable layer, as in Appellant's claim 24.

¹⁵ Examiner's Answer dated 8/17/2009, Page 11.

¹⁶ Kaschemekat, Abstract

¹⁷ *Id.*, Col. 11, lines 40-42.

¹⁸ *Id.*, Col. 4, lines 40-42.

¹⁹ *Id.*, Col. 10, lines 59-64.

**(5) Claim 31 are not obvious over Kaschemekat
in view of Wohlstatter**

Claim 31

Claim 31 limits the membrane to be comprised of a sintered metal disc coated with a polymer.

At least for the reasons given for claim 24, these claims are also patentable over the alleged combination of Kaschemekat and Wohlstatter.

This Reply Brief is accompanied by a Request for Oral Hearing.

For these reasons, and the reasons stated in the Appeal Brief, Appellants submit that the final rejection should be reversed.

Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: September 18, 2009

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